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PROBLEMS FOR SOLUTION.

ALGEBRA.

298. Proposed by W. J. GREENSTREET, Marling School, Stroud, England.

Find an approximation to the difference between the sums of n harmonic and n arithmetic means between a and b , when a is very nearly equal to b .

299. Proposed by C. N. SCHMALL, 89 Columbia Street, New York City.

The sides of a triangle and the area are in arithmetical progression. Find their values, and show there is only *one* solution in rational integers.

GEOMETRY.

331. Proposed by C. N. SCHMALL, 89 Columbia Street, New York City.

The center of two spheres radii r_1, r_2 , are at the extremities of a straight line $2a$ on which as a diameter a circle is described. Find a point on the circumference from which the greatest portion of spherical surface is visible.

CALCULUS.

255. Proposed by G. B. M. ZERR, A. M., Ph. D., 4243 Girard Avenue, Philadelphia, Pa.

Find the general values of u and v in terms of x , which satisfy the equations $u^2 + l^2 (du/dx)^2 = v^2$, $u^2 + m^2 (du/dx)^2 = v^2 + n^2 (dv/dx)^2$

256. Proposed by S. A. COREY, Hiteman, Iowa.

Prove that $\sum_{x=0}^{x=\infty} \frac{x^{2m}}{1+x^{2n}} = \frac{\pi}{2n \sin \frac{2m+1}{2n} \pi}$, m and n being positive integers

of which n is the greater.

257. Proposed by G. B. M. ZERR, A. M., Ph. D., 4243 Girard Avenue, Philadelphia, Pa.

If $A = \int_0^\infty \frac{dx}{\sqrt{x} (2a+x)^n}$, $B = \int_0^\infty \frac{y^n dy}{\sqrt{y} (a^2+y^2)^n}$, find A/B .

MECHANICS.

215. Proposed by R. D. CARMICHAEL, Anniston, Ala.

Determine the curve in a vertical plane along a chord of which a particle will slide under the force of gravity and the retardation of friction so that it will traverse the whole length of the chord in a time t which is independent of its direction as long as the upper end of the chord remains fixed. Discuss the result.